

ODU/Jefferson Lab REU students will have opportunities to work on forefront research topics in Nuclear Physics and Accelerator Science. A few areas of research are:

- Detectors for Nuclear and Particle Physics
- Quantum Chromo Dynamics at high energy
- Superconducting radio-frequency (SRF) accelerating structures
- Novel accelerator designs
- High-current, high-polarization electron guns

### Stipend

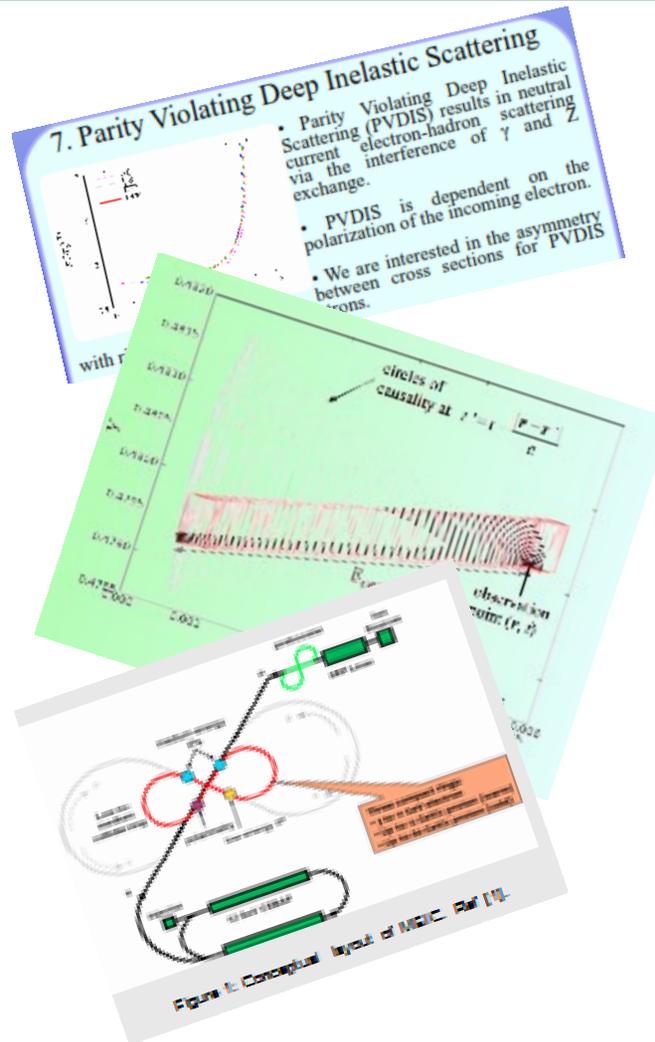
Participants receive a stipend of \$500 per month, room, and partial meal allowance *and* travel expenses.

### Application deadline

February 15, 2013

### Program Duration

10 Weeks



Visit <http://www.jlab.org/accel/reu/index.html>

Or, contact  
 H. Areti (aret@jlab.org)  
 S. Bueltmann (sbueltma@odu.edu)

## Research Experience For Undergraduates

### Summer Research Opportunities in Accelerator Physics and Nuclear Physics 2013

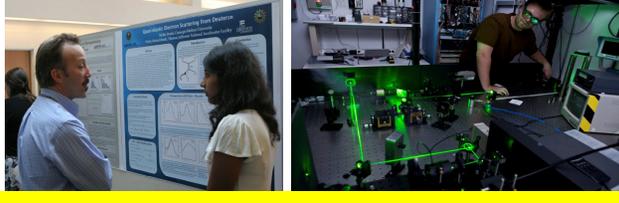


Old Dominion University  
 in association with



Jefferson Lab





## Center for Accelerator Science

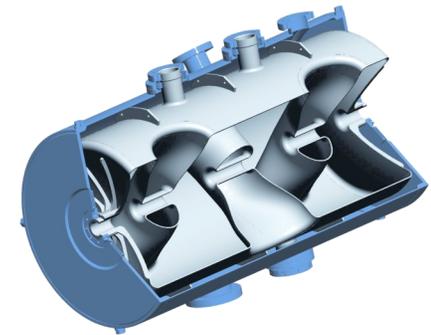
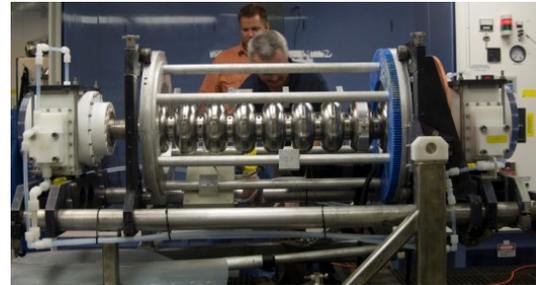
Old Dominion University is located in Norfolk, part of Hampton Roads, a conglomerate of seven cities. The area is home to Northrop Grumman Ship Building, NASA Langley Research Center as well as several colleges and universities and boasts a vibrant research activity in many science and engineering fields.

The Center for Accelerator Science, in partnership with Thomas Jefferson National Accelerator Facility (Jefferson Lab), aims to meet the nation's need for scientists who will advance the sciences and technologies of particle accelerators and light sources for use in basic science, applied science and industry. The students will have access to state-of-the-art facilities at both ODU and Jefferson Lab.

Jefferson Lab and the Center share a number of common research interests. The center's faculty participate in design of cavities for various contemplated advanced accelerators such as the International Linear Collider (ILC), the Facility

The major areas of research in the Physics Department at ODU are:

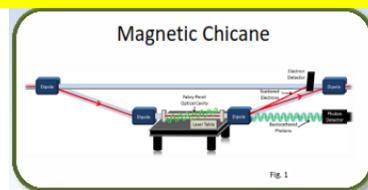
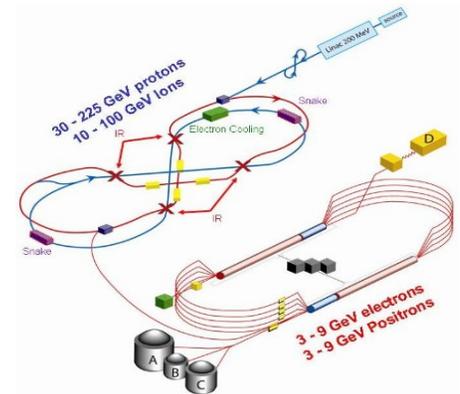
- Nuclear and Particle Physics
- Atomic, Molecular and Optical Physics
- Accelerator Science
- Condensed Matter Physics
- Material Science
- Geophysics



for Rare Isotope Beams (FRIB), the Electron Light Ion Collider (ELIC) and the Muon Collider.

ODU/Jefferson Lab REU students work within a group consisting of scientists, engineers, technicians, graduate students and other undergraduate students. The students stay at Jefferson Lab's Residence Facility and enjoy a variety of social activities.

ODU/Jefferson Lab REU students have opportunities to present their research at conferences and co-author scientific papers. A 2011 student presented his research at the 2nd International Particle Accelerator Conference, San Sebastian, Spain (Sept. 2011). Based on his REU research, a 2010 student won both the 3<sup>rd</sup> prize at SERCh competition at Argonne National Laboratory and the prestigious Barry M. Goldwater scholarship.



$$\Delta_{\text{radiation}} = (2u + (1-2u)(1-\max)^{2u})^{1/(2u)} - 1, \quad 0 < u < 0.5$$

$$\Delta_{\text{radiation}} = (1-2u + 2u(1-\max)^{2u})^{1/(2u)} - 1, \quad 0.5 < u < 1$$

$$\Delta_{\text{recombination}} = 0.5dx(2u(1-\frac{1}{2b_{\text{min}}^{2u}}))^{1/(2u)}, \quad 0 < u < 0.5$$

$$\Delta_{\text{recombination}} = 0.5dx(\frac{1}{2(1-u(1-\frac{1}{2b_{\text{min}}^{2u}}))})^{1/(2u)}, \quad 0.5 < u < 1$$

